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ABSTRACT

This buyer's guide for personal computers is the result of two initiatives: to meet the need for a government-wide policy concerning the management of end user computing (EUC); and to condense procedures for EUC acquisition. The guide is for federal government line managers and professionals who are unfamiliar with step-by-step procedures used in the acquisition of equipment for EUC. EUC can include elements of data processing, office automation, word processing, telecommunications, and other information activities and services. Oriented toward acquisition of microcomputers and associated products, the first six chapters provide the federal manager with the necessary information to accomplish proper acquisitions. The sections cover: (1) Planning for End User Computing; (2) Analyzing Costs and Benefits: Efficiency or Effectiveness; (3) Ten Step Justification, including Problem Statement and Solution Statement; (4) Sources of Supply; (5) The Procurement Action; and (6) a Summary. The remaining chapters are appendices covering: two hypothetical documentation and justification packages; a discussion of the impact of standardization; a look at network decisions; a regulatory overview; a discussion of lessons learned from the General Services Administration (GSA) EUC pilot project; and records management considerations. (THC)

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End User's Guide to Buying Small Computers

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In July 1982, Ray Kline, Deputy Administrator, General Services Administration (GSA), directed GSA's Office of Information Resources Management (OIRM) to meet the need for a Government-wide policy concerning the management of end user computing. In June 1983, GSA, OIRM, published Managing End User Computing in the Federal Government, the product of an interagency task force. Two Government-wide initiatives were identified: to develop a buyer's guide for personal computers and to condense procedures for EUC acquisition.

This guide is the result of those two initiatives. It was developed by an interdisciplinary task force within GSA. Its principal authors were:

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The guide is for Federal government line managers and professionals who are unfamiliar with step-by-step procedures used in the acquisition of equipment for end user computing (EUC). EUC can include elements of data processing, office automation, word processing, telecommunications and other information activities and services. This guide is oriented toward acquisition of micro-computers and associated products. This guide reflects regulatory changes that simplify the acquisition of EUC.

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End User Computing: A Buyer's Guide

The End User's Guide to Buying Small Computers has been prepared by the Office of Information Resources Management of the U.S. General Services Administration (GSA). The guide is for Federal Government line managers and professionals who are unfamiliar with step-by-step procedures used in the acquisition of equipment for end user computing (EUC). The first six chapters are all the busy Federal manager may need. The remaining chapters include Appendices covering related topics. This guide is consistent with GSA's objective of satisfying Federal ADP needs at the lowest overall cost with maximum practicable competition.

EUC is done by self-reliant Federal agency personnel, largely independent of the traditional data processing applications development process. EUC can include elements of data processing, office automation, word processing, telecommunications and other information activities and services. Although EUC can be performed on terminals connected to larger computers, this guide is oriented toward acquisition of microcomputers and associated products.

Many traditional ADP acquisition methods require modification for low cost procurements of EUC. This guide reflects recent regulatory changes by GSA/OIRM that simplify the acquisition of EUC, but it does not itself supersede agency policy. Nevertheless, to encourage effective use of EUC technologies, agencies should ensure that their EUC policies and procedures are clear, concise, and consistent with this guide and any subsequent GSA regulatory changes. Steps explained in this guide may be used to obtain approval for small acquisitions or approval for orders under large agency contracts.

Depending on your agency's policy, you should seek advice from your data processing and procurement professionals if you are considering the purchase of end user computers. You should particularly seek such expert help if you plan to link small computers together or to a larger system, or if you plan to acquire a large number of small computers. Such procurements are probably outside the scope of this guide.

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Chapter I.
Planning for End User Computing

Information is a shared organizational resource. End User Computing (EUC) is a tool for managing that resource, not an end in itself. Managers must plan for the efficient use of agency information resources and are obliged to follow agencywide policy and planning documents when implementing an EUC solution.

In planning for EUC, managers must evaluate their problems in the context of the agency's mission, functions, and resources. When doing this, managers should not overlook the cost and value of information. They must develop a plan that fits the size and scope of the problems to be solved and the expenditures to be made. This guide can be a tool in overcoming such difficulties.

Planning Process

Building from a premise of agency mission and goals, planning answers basic questions, such as, what, who, when, where, how, and how much. The next step is to break down EUC implementation into events or milestones, indicating which must be completed before others may begin. Work breakdown is followed by scheduling; this is when resources and personnel are identified and commitments are made. With a schedule in hand, one can control the project, locate bottlenecks and slippage, and take prompt corrective action.

Although the rest of this guide will provide general questions to consider, the particular steps and persons involved in each agency's acquisition and management process must be identified. Some of these may include:

- What is the agency justification and approval process?
- What agency procurement policies and practices apply?
- What assistance is available from the IRM staff?
- What agency standards or mandatory sources limit the selection of hardware, operating systems, and software?
- What are the budgetary procedures and constraints?
- What are the sources of EUC items, and who will buy them?
- What training is needed, and who will conduct it?
- How will EUC be reviewed after its installation?

Human Factors

Remember that successful implementation of EUC depends upon the people whose jobs are affected. Part of planning and implementation must include a strategy for user support. Consider the following human factors:

- Who are the people that want to use EUC equipment and that will help it succeed?
- Which prospective users will realize immediate benefits in their daily work?
- Which managers are committed to investing not only the price of equipment,

but also the hours their employees must spend learning to use it?

- Who may be affected by stress during this period of significant change?
- What steps will you take to promote a healthy adjustment?

Answering questions such as these and anticipating problem areas will greatly improve chances for a smooth, successful EUC acquisition. Planning is worth the effort because it can help acquire the right items at a reasonable price and in a timely manner.

Chapter II. Analyzing Costs and Benefits: Efficiency or Effectiveness

The acquistion process should not be an obstacle to effective use of EUC technologies. Recent changes to the ADP regulations make clear that the degree of analysis and documentation supporting an acquisition should match the size and complexity of the need.

Therefore, one to three pages should normally be sufficient to document the need and obtain approval for a single device or a small number of low cost microcomputers and associated software. (See Appendix D for a discussion of the current Government wide regulations, bulletins, and other publications governing the procurement and management of ADPE in the Federal Government.)

Before writing a justification for acquiring EUC equipment either as a single procurement or as an order under an existing contract, one should determine the method of showing that the benefits of end user computing outweigh the costs. This justification may be based on either increased efficiency or improved effectiveness (or a combination of the two). If the improvements in either efficiency or effectiveness are not explained, the justification probably will be challenged.

Efficiency Justifications

Efficiency justifications compare costs under existing conditions with the costs of buying and using automation. Improvements are procedural but products are essentially unchanged. Some examples of new EUC capabilities used to improve efficiency are electronic spread sheets, word or text processing, graphics for reporting, data base management, and project management.

Compare the cost of current procedures with the costs of buying and using EUC, to determine whether the bottom line is advantageous over the life of the EUC sysyem. Remember that for low cost EUC, the comparison should be simple and straightforward.

Some questions that may help you estimate the bottom line are:

Time. About how many hours does it take to do the job each time it is done? How

often is it done? What is the approximate salary paid for those hours? Use round numbers, whole days, and other rough measurements.

Cost. What are the costs of contracts or payments made to keep the present system running? Use the previous year's totals which should be easy to obtain.

Maintenance. Does equipment break down often? What is the approximate cost of waiting for repairs? How much is spent on repairs? Use the previous year's total of payments to the repair contractor which should be easy to obtain.

Personnel. What will be the approximate cost in salaried time to do the job with EUC equipment? Use round numbers.

Equipment. How much is planned to be spent on EUC software, hardware, and peripherals?

Other. What other significant costs will be introduced, such as communication lines, training courses, etc.?

Payback. How many years must go by until the break even point, after which savings will be achieved if conditions do not change?

Life. What is the expected system life?

The system life is a reasonable period of time over which the EUC is expected to be used for the specified purpose. The minimum number of years for system life is the break even point. Savings do not have to be realized in the first year, but replacing tedious paperwork with low cost EUC may show a quick savings in labor.

Effectiveness Justifications

Increased effectiveness means a better accomplishment of the overall mission. Improvements usually depend upon adding EUC capabilities to support new products, new functions, better decisions, or better management. Some examples of new EUC capabilities that might increase office effectiveness are project management, economic modeling, document retrieval, statistical analysis, computer conferences, and access to Government or public data bases through telephone lines.

The performance of managers and professionals cannot be easily quantified. Therefor the efficiency justification may not address critical issues because of a lack of measurement data. The effectiveness approach may meet resistance due to the subjectivity of the benefits anticipated. Furthermore, since effectiveness improvements tend to confront basic assumptions, they may be more controversial. Despite resistance to subjectivity and basic change, effectiveness improvements are often more significant to the overall organization than efficiency improvements.

There may be no simple cost comparison for justifications based upon effectiveness improvements. Instead, the manager may have to identify the worth of new capabilities in terms of the quantity, quality, timeliness, or organization of his or her office's work. Some factors to consider are:

Problems. Identify the nature or cost of past problems or mistakes that will probably be avoided.

Savings. Identify the improvement in future decisions or management. If possible, express this as a dollar amount to be achieved by the improvement.

Benefits. If no dollar value can be figured, the benefits will have to be explained clearly enough to show an informed, rational decision.

Justifications may be based on a combination of increases in efficiency and effectiveness. Appendix A contains hypothetical documentation and justification packages that illustrate both types of justification.

Chapter III.
Ten Step Justification

This chapter explains how the end user can carry out an analysis for acquiring small computers with limited technical support. The ten issues or steps described below will provide the requirements analysis, documentation, and justification necessary to comply with the spirit and intent of the ADP regulations. Issues 1 through 6 define and analyze the problem. Issues 7 through 10 address the solution. Not all the questions listed under each issue need be answered—only the ones judged to be appropriate to the particular acquisition decision.

Although the dollar cost can be small, failure can frustrate implementation of these valuable technologies. Therefore, we encourage seeking help from agency data processing and procurement professionals in considering these often difficult issues. To provide some perspective on these steps, two examples are given in Appendix A.

Problem Statement

The first six steps outline a thorough statement of the problem or opportunity at hand. One should understand the goal before determining the means.

Problem Definition

What problem will be solved by acquiring an end user computing capability? Are they existing problems, new requirements, or opportunities for potential improvement?

This is the most important, and perhaps most difficult step in the acquisition process. Problems may be analyzed either in a single organization or in several organizations simultaneously. A statement of need may include similar work or functional categories at many different places, thus saving expensive, repetitive documentation. An aggregated statement has the added benefit of highlighting the organization's needs for compatibility, standardization, and communications support. (Appendix B of this guide discusses the impact of standardization. Appendix C discusses the network decision.)

Functions To Be Performed

What applications (i.e., information processing functions) will be performed on the EUC equipment? How will office procedures be changed? What are the communications requirements?

Current information management processes may be improved by such EUC applications as: office automation, word processing, data base management, project management, communication, graphics, electronic spread sheets, and statistical analysis. Standards (Appendix B) and networks (Appendix C) can further increase the utility of information.

When planning an EUC application, consider the following four categories of information processing functions. Cite the applicable functions in the justification. This will demonstrate that the proposed system has been throughly considered.

- How will information be "input" — amount, frequency, sources, and methods (such as keystroke)?

- How will information be organized — data bases, file managers, or document managers?
- How will information be analyzed — statistical, scientific, or text processing programs?
- How will information be reported — spreadsheets, graphics, or text formatting?

Justification Over the System Life

What effectiveness and/or efficiency improvements are expected? (See Chapter II) What is the expected life of the problem, function, or proposed EUC solution? (The system life is the shortest of these three.) Will improvements occur within the system life?

At some point, quantifiable benefits from most new systems should equal the cost of buying EUC. This is called the break even point and should occur within the system's life. One does not need to determine a system life if the proposed configuration costs less than $25,000 and purchase is deemed the best course of action. However, estimating the system life can help with cost/benefit and lease /purchase analyses. Factors to be considered in determining system life are listed in Appendix E.

The value of the anticipated improvements should not only outweigh the costs of the proposed acquisition, it should also exceed the costs of taking no action.

Records Management, Data Privacy, Security and Integrity

What are the records management considerations? Will the documents and analyses have legal, contractual, or historical significance? Will someone need to prove a point with a recently altered or erased file?

What data or information will be created, sent, or maintained on the proposed system? Who will maintain it; how will it be stored; and who will need access to it? How sensitive is the data; what legal or procedural controls apply; who might be affected by its unauthorized or unanticipated distribution? What measures should be taken to prevent such events?

These questions go beyond the security of sensitive data to the physical security of the equipment, software, storage media, and supplies. The Privacy Act of 1974 imposes numerous requirements on Federal agencies to prevent the misuse or compromise of data concerning individuals. Similarly, the Administrative Procedure Act, the Freedom of Information Act, the Government in Sunshine Act, and various OMB Circulars can impact EUC data management. Finally, 18 USC 1965 prohibits any officer or employee of the United States from disclosing certain kinds of business, confidential, or trade secret information unless authorized by law. Therefore, prudence and agency policy may require consultation with agency specialists. (See Appendix G for further discussion of electronic record keeping.)

Organizational Implications

Will the application support an individual worker or others doing similar work? What agency applications, systems, and components are involved? What are the organization's attitudes toward and experience with EUC hardware, software, and techniques? Who does training and organizational development? What are the requirements for expanding EUC into other uses now provided by centralized systems or by other offices? Will EUC data, software, or hardware become essential to the organization's operation? What other hardware and software exists in the organization? Will new EUC need to be compatible with these items? (Again see Appendices C and D.)

Environmental Factors

What are the space management considerations, such as equipment location; supplies storage; heating, cooling, cabling, and electrical supply require-

ments; coordination with the building manager; and employee needs, such as video screen and keyboard placement, lighting, noise, fatigue, and other ergonomic concerns?

Your supply office may already have a catalogue of GSA's ergonomic furniture. If not, ask them to contact GSA's Office of Federal Supply and Services, Furniture Commodity Center, on FTS/703-557-8636.

Solution Statement

Having shown an understanding of your problem, you next study the various means of solving it. The remaining four steps document your solution.

Alternatives

Is it possible to solve this problem by other means, such as the sharing of existing agency systems or by using non-ADP resources or commercial ADP services? Of the feasible alternatives, which represents the lowest cost?

Do not feel obligated to accept alternatives that will not effectively solve the problem.

Software and Hardware Requirements

What off-the-shelf (commercially available) software and hardware will solve the problem? Where can one see them demonstrated? What solutions have worked for those with similar needs? What training, support, and maintenance is necessary?

The software solution is crucial. One of the most attractive elements of EUC is inexpensive, commercially available software that will solve most user problems. The selection of commercial software ordinarily will influence the hardware selection. Most popular software products, however, are available to run on most hardware systems.

Be sure to observe all copyright restrictions on commercial software.

Consider the expansion capability of hardware to meet future needs. Such capability may be worth some increased cost. Also consider that the price of EUC equipment continues to fall while capability increases almost daily. The advantages of having EUC in use early must be weighed against waiting for improved products that will meet more requirements.

The range of competition is important when defining one's requirements. It is preferable that requirements be stated in functional terms instead of describing the brand and model of software and hardware desired. A brief survey of the market should reveal a number of vendors and sources that can meet functional requirements.

The regulations state that your analytical effort be put in the perspective of the value and significance of the procurement. Avoid excessively detailed and complex studies to justify a small cost acquisition. (See Chapter V.)

Configuration Selection

Where can one get the hardware, software, telecommunications, maintenance, training, and consultation necessary? How does one choose among the seemingly endless number of vendors? Does one advertise in the Commerce Business Daily? Does one prepare a statement of work or request for proposal? How does one use an agency contract, the ADP Schedule, Office Technology Plus (GSA's computer store)? (Chapter IV covers many of these questions.)

The only person with the authority to procure the solution is a contracting officer. Bringing him or her into the

initial planning and research can develop a positive relationship that can meet functional needs as well as the Government's objectives of competition and cost. (See Chapter V.)

Although a technical expert may not be needed to select a successful configuration, some research into the variety of solutions is essential. Information can be obtained from sources such as user groups, agency software experts, Office Technology Plus, and other retail computer stores. Numerous commercial periodicals and government documents cover current products and potential applications. Since the evaluation and selection process can quickly become quite complicated, consult with agency data processing and procurement personnel for advice on the latest improvements in technology and prices and how to take advantage of them.

Post Installation Evaluation

When, how and by whom will benefits of the system be evaluated?

Managers should occasionally review EUC to ensure continuing efficient use. Reviews should be supportive of users and managers who find new, additional ways to solve problems with their EUC and who share new ideas throughout the organization.

- What will be the criteria for assessing improvements in efficiency and/or effectiveness that will result from acquiring new or additional equipment and software?
- If the EUC hardware or software is not being used effectively, what actions will be taken to ensure reuse?
- How much will the EUC solution cost?

The value of the anticipated improvements should not only outweigh the costs of the proposed acquisition, it should also exceed the costs of taking no action.

Managers should occasionally review EUC to ensure continuing efficient use. Reviews should be supportive of managers who find new, additional ways to solve problems with their EUC and who share new ideas throughout the organization.

Chapter IV. Sources of Supply

Once the decision to acquire EUC has been made and approved, users should work with their procurement support staffs to select the items and the sources of supply that will be most cost effective in meeting their requirements. Regardless of which procurement alternative is selected, the procurement file must show the reasons why the items being procured and the method of procurement selected will satisfy the requirement at the lowest overall cost to the Government, price and other factors considered. All quantifiable factors, including the administrative cost of conducting the procurement and the cost and availability of maintenance and training, should be identified in the justification.

The following sources of supply should be considered.

Sharing and Reuse

As part of step 7 in Chapter Three, one should consider sharing existing agency resources. The agency may already have software which could be used depending on

licensing agreements. Public domain software is another inexpensive approach, if one is willing to assume the cost of self-support. Evaluate potential for obsolescence when deciding to reuse ADP equipment.

To determine whether agencies have reported excess equipment to GSA that will meet your EUC needs, review the ADP Resources Availability List that GSA publishes every other week. A hold may be placed on such items by calling GSA (KHEE) on 202, or FTS, 566-1284. The item may then be obtained by submitting a completed Standard Form 122 to GSA (KHEE), Washington, DC 20405.

Agency Contracts

If an agency has awarded a mandatory contract for microcomputer [illegible] software that will meet the user's requirements, the item(s) must be acquired from that source. If a nonmandatory agency contract is in place, it should be considered along with the other procurement alternatives discussed below. Agency contracts can be used to achieve the benefits of de facto standardization described in Appendix B.

Small Purchases

Small purchase procedures (see Federal Acquisition Regulation (FAR) Part 13) may only be used when the value of the procurement is $25,000 or less. Conducting a small purchase procurement involves orally soliciting quotations from a reasonable number of manufacturers or dealers in the local area. Since these quotations may be higher than prices available under schedule contracts or from GSA's computer store, the buyer should review prices available under schedule contracts and the store before awarding under small purchase procedures. For purchases between $1,000 and $25,000 the FAR states, "Contracting officers shall solicit quotations from a reasonable number of qualified sources to ensure that the purchase is advantageous to the Government, price and other factors considered, including the administrative cost of the purchase." (Note.--FAR § 13.106(b))

Formal Solicitations

EUC equipment can be acquired by issuing a formal solicitation document. Under the formal advertising method of procurement this involves the issuance of an invitation for bids and the award of a contract to the responsive, responsible bidder offering the lowest price. The negotiated method of procurement is normally used for ADP. This requires the issuance of a request for proposals, negotiation, and award to the lowest overall cost offeror that meets the Government's minimum requirements. The solicitation and negotiation process is relatively lengthy and expensive and is normally appropriate for high dollar value procurements or for items that cannot be obtained through Office Technology Plus, a schedule contract, small purchase procedures, or an agency contract. Formal solicitations will usually result in low prices. However, due to their relatively high administrative costs, they are rarely cost effective for acquiring small quantities of inexpensive computers.

Office Technology Plus

Office Technology Plus (OTP) may only be used for individual orders up to $100,000. The OTP stores offer a number of services to Federal agencies in the Washington, DC, and Philadelphia, PA, metropolitan areas. These services, which include system configuraton, maintenance, no-fee seminars, and rapid delivery, may influence the overall cost of acquiring and implementing a system. Items may be ordered through the store by delivering a properly executed purchase order to the store. A synopsis in the Commerce Business Daily (CBD) or a dele-

gation of procurement authority (DPA) from GSA are not required.

Schedule Contracts

The ADP schedule contracts (under sections A and C) offer a wider range of equipment and software than OTP. However, the extra services available at OTP are normally not available under schedule contracts. Maximum order limitations (MOL's) vary among schedule contracts, but orders of up to $300,000 are within the MOL's of most schedule contracts. Orders above $300,000 require a DPA from GSA. The intent to place schedule orders in excess of $10,000 must be synopsized in the CBD at least 30 days before placing the order. (See note at end of this Chapter.)

Both the store and the schedule prices reflect significant discounts from vendors' commercial prices. Schedule prices will often be lower than prices in the computer store, but the value of the services offered by the store (if needed by the user) may offset the price difference.

The most cost effective method for procuring small numbers of low cost EUC will normally be existing agency contracts, GSA's CTP store, or a GSA non-mandatory ADP schedule contract. (Note.—GSA Bulletins FPMR F-156 and FPR 61, dated August 19, 1983, discuss in greater depth GSA's computer store and the various alternatives for acquiring end user computers.)

NOTE. This synopsizing requirement stems from Public Law 98-72. At the time of publication, GSA was seeking the concurrence of the Small Business Administration in a blanket exemption from the $10,000/30-day synopsis requirement. Pending a decision on the blanket exemption request, GSA plans to amend FIRMR Temporary Regulation 71 to implement the synopsis requirement. The current FIRMR notice requirement has a $50,000 threshold and a 15-day period.

Chapter V.
The Procurement Action

Only a contracting officer may commit agency funds to the purchase of all end user computing equipment obtained commercially. Develop a positive relationship with this key individual.

There are several measures one can take to encourage this relationship. First, talk with the officer about plans long before deciding on what to buy but after drafting problem definition and functions to be performed. Discuss any ambiguity about the nature of the solution and communicate a desire to satisfy procurement policy requirements. Remember that contracting officers are often subjected to high pressure tactics. Do not try to substitute knowledge of the procurement process for that of the contracting officer. In return one will normally receive cooperation and respect for one's program and management expertise.

Contracting officers have unique authority, literally a warrant or license to procure, granted by higher procurement authorities. Failure to follow the regulations can cost a contracting officer their warrant and have serious career implications. Therefor, contracting officers are usually quite careful to document the procurement file to show that the regulations were followed. Those program managers that follow the Ten Steps discussed in Chapter III will provide the contracting officer with the documentation that protects against negative audit findings and vendor protests.

Three Principles

Although there are many pages of regulations, there are three basic principles for ADP contracting:

- o Minimum (anticipated) need
- o Maximum practicable competition
- o Lowest overall cost, price and other factors considered

As noted earlier, one should not sell his or her objectives short unless they are not feasible or not cost effective. A bargain is no bargain if it does not meet the Government's needs. Neither should one waste taxpayers' dollars for unnecessary features and capabilities. Although the contracting officer has a duty to prevent needless expense, the program manager is ultimately responsible for accomplishing goals with the resources given.

Work with contracting officers in searching out alternatives and vendors. Contracting officers strive to get a fair price for the agency by expanding the range of competition. Furthermore, they are concerned about the competitive nature of subsequent procurements. They will not welcome sole source follow-on acquisitions.

ADP Procurement Points

The following points are helpful in ADP procurement. (See Appendix E for further details.)

Consider the administrative cost of conducting the procurement.—A response to a notice in the Commerce Business Daily may indicate a lower price than the price available on the ADP Schedule. The contracting officer may still order from the Schedule if the difference in price is more than offset by the time and cost required to issue a solicitation. The procurement file should be documented. (See FIRMR § 201-4.1102-9 and § 201-4.1109-6.)

Avoid paralysis by analysis. FIRMR Temporary Regulation 71 says that the costs of analysis should be commensurate with the cost and/or benefits of the acquisition. Of the hundreds of EUC hardware vendors, several that appear to meet requirements should be found and evaluated. (See FIRMR §/201-4.1102-10.)

Lowest price does not necessarily mean lowest overall cost. When evaluating your potential sources of supply and vendors, carefully consider the other factors that can significantly contribute to the lowest overall cost to the Government. Some equipment may be cheap, but it can cost dearly in training, maintenance, operational capability and flexibility, adverse environmental and organizational impacts, and other factors. (See FIRMR §/201-4.1102- 10.)

Compatibility may save money. Decide which existing resources are valuable to the EUC application. For Step 4 of Chapter III, include an estimate of what it would cost to duplicate or convert these resources for compatibility. This estimate can more than offset potential benefits from acquiring incompatible equipment. Armed with such a rationale, the contracting officer can consider the appropriate sources, confident the Government is getting the lowest overall cost. (See FIRMR §/201-4.1109-12.)

As you gain the contracting officer's confidence, the two of you can work more closely in evaluating vendors and sources of supply. By demonstrating sensitivity to the three basic principles of ADP contracting, end users can help the contracting officer do his/her job better. This will allow faster and far more successful acquisition of EUC.

Chapter VI. Summary

As end user computing technologies improve and as agencies seek to increase the productivity and effectiveness of their personnel, line managers will find EUC a growing source of solutions. This guide should help line managers meet agency needs promptly with proper acquisitions.

To repeat the points of the previous chapters, first plan the EUC procurement. Identify the people and policies that must be dealt with, particularly among the data processing and procurement staff. Understanding the merits and differences of efficiency and effectiveness justifications, follow the Ten Steps to Justify EUC. These are:

- Problem Definition
- Functions To Be Performed
- Justification Over the System Life
- Records Management, Data Privacy, Security, and Integrity
- Organizational Implications
- Environmental Factors
- Alternatives
- Software and Hardware Requirements
- Configuration Selection
- Post Installation Evaluation

Meet with data processing staff to review the problem statement and proposed solution for technical feasibility. Discuss with the contracting officer not only the specifics of the requirement, but also the objectives and constraints of the procurement process. Finally, look to the future by considering:

- The Impact of Standardization
- The Network Decision
- Regulatory Overview
- Lessons Learned from the GSA End User Pilot Project
- Records Management

Chapter VII. Appendix A Hypothetical Documentation and Justification Packages – Example One

This example follows the ten-step format for a simple, stand-alone EUC application. It describes how a single user, the branch secretary, will report travel expenses against the plan to the branch chief for 30 professionals who work in the field. The EUC procurement will be for a single microcomputer-based system, electronic spread sheet with graphics software, and a printer.

Problem Statement

Problem Definition. The problem is that agency MIS Travel Fund Reports are not timely, not available on a cumulative basis, and have no comparison of plan vs. obligations. The branch secretary spends much valuable time trying to maintain a manual system while falling behind in other duties. The branch chief needs to better manage travel funds in support of the program, and to discuss corrective actions with field workers before serious problems occur. This will avoid end-of-year fund difficulties.

Functions to be Performed. EUC will replace the manual spread sheets of branch travel data. Field workers will continue to submit weekly travel forms XYZ-99 to the Branch for forwarding to Central Office ADP. The branch secretary will enter the data to EUC by keystroke from these forms. EUC produced and printed spread sheets are in addition to graphs showing the expense vs. plan for each field worker. The totals for the branch will be given to the branch chief. Thirty field worker travel reports will be entered weekly. Printout of data will occur monthly, except perhaps weekly during the last quarter. There will be no data communications requirement.

Justification over the System Life. The cost of this system will be less than $25,000, therefore no system life is required to be set. EUC will save about 16 hours of secretarial time for each report, 14 times per year, or about 336 hours worth $3,360. The secretary's time saved will be applied to the typing backlog. EUC will permit better management of travel funds by the branch chief.

Records Management, Data Privacy, Security, and Integrity. Data content is each field worker's travel expenses. The secretary will key enter, change, and be responsible for data. Field workers will have access to their own travel fund status with a telephone call to the secretary, but not access to the status of other field workers. The branch chief will have access to all data. The data base will be at EUC workstation on floppy diskettes. The diskette storage rack will be in the administrative file cabinet. The files are administratively confidential and diskettes will be locked with other such data in the file cabinet nightly by the secretary.

This EUC application can be audited for management decisions on the allocation of travel. One copy of each printed summary report to the branch chief will be retained for five years, according to the Agency records schedule. At end of each month a backup copy of the floppy disk will be made and kept for one month, in case of accidental erasure or other mishap.

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Organizational Implications. Agency MIS will not be affected. No expansion is planned. Branch secretary has a positive attitude to the change.

Environmental Factors. The microcomputer and the printer will be placed on the branch secretary's credenza. The electrical outlet behind dask will be used. The building manager recommends using an electrical surge protector (about $50) because other equipment uses the same circuit. No other special equipment is needed.

Solution Statement

Alternatives. No agency data processing support is available. The cost of obtaining services would exceed cost of EUC for this small job. No excess equipment is available.

Software and Hardware Requirements. Brief demonstrations show that several electronic spread sheet and graphics software products will operate on a variety of hardware. The entire system will cost about $3000. The hardware must include a standard typewriter keyboard with a ten-key numeric keypad that is similar to a calculator in use and in layout, and a screen on which columns of numbers are legible. The printer must be able to support graphics.

Configuration Selection. The contracting officer advises that no in-house contract exists. He recommends OTP because the need includes putting system components together to operate and training for the user. A visit to the store showed three systems capable of meeting the need. The lowest priced of these three is satisfactory, i.e. $2,695.

Post Installation Evaluation. Six months after installation the Branch Chief will verify that travel costs are done on the system and that no manual spread sheets are needed or used. The typing backlog will be assessed to verify that secretarial time is being better used. Additional uses will be considered for the system. If it is not performing up to expectations it will be offered to other organizations for reuse.

Chapter VIII. Appendix B Hypothetical Documentation and Justification Packages – Example Two

Consider a regional office with [illegible] contracting officer representatives (COR's) administering $20 million in contracts per year. Currently the region has a data key entry contractor convert its paper reports to magnetic tape for the central office data system. The system frequently proves untimely and unresponsive, with serious results as explained below.

The example follows the Ten Step format for a pilot of EUC to solve a complex problem. The manager anticipates the

need for a network of portable microcomputers among his field workers and his own office.

Acquiring and installing the desired EUC network will be a complicated and lengthy process, involving persons outside the user's organization. The manager believes the system can be built from off-the-shelf software and hardware. Coordinating the data that would be sent via telephone would be the most complex part of the network system.

To solve the problem the manager has decided to divide the issues into two steps.

First, acquire a single portable EUC unit for a volunteer field worker who is eager to try the new technology. This step will demonstrate the worth of freestanding EUC in the field.

Second, should the pilot indicate that EUC for all field workers is desirable, network capability will become a possible additional feature, at a small increment in cost. The manager has chosen to carefully document the pilot to determine if additional EUC would be cost effective.

Problem Statement

Problem Definition. COR's need a faster system for tracking contracts, calculating payment data and authorizing payments to contractors for progress against milestone objectives as a production incentive, and to obtain prompt payment discounts. The estimated worth of the program in this Region is $20 million per year.

The Regional office is behind in its paperwork by two or three weeks, causing contractors to complain of late checks. Payments are actually based upon field worker manual spread sheets, not the central office printouts. Under the Prompt Payment Act (Public Law 97-177, May 21, 1982), payments must be timely, or interest penalties are required.

Also, monthly reports to Central Office require a tremendous, hectic rush to bring cases up to date.

Functions to be Performed. COR will enter contract performance data onsite. EUC will indicate the payment to be made, if any, plus produce a report for the regional office. The regional office will assess progress and track payments.

For the pilot, contract data will be printed for the data key entry contractor. The potential exists for data telecommunication.

COR visits 10 sites weekly, with three pages of data to enter for each. (All field workers handle about 300 pages per week, which could be managed in the regional office by a microcomputer with a peripheral storage device.)

Justification over the System Life. The pilot study will run for about 6 months to a year. The results will be analyzed by the COR user and the manager. Quantitative improvements are reduced penalties paid to contractors for lateness. Qualitative improvements are better reports to the manager, plus improved relations with contractors and central office.

If a network is acquired, regional office records will be up-to-date and the region will be able to monitor trends.

The greatest potential savings for the Government available through the network under consideration are not directly measurable, and will be realized when timely payments provide an increased incentive to reduce future contract prices and bids. About $20 million per year is paid through the program.

The cost of penalty interest payments to contractors is currently at the rate of $200,000 per year. The estimated cost of $60,000 for EUC equipment required by the network under consideration could be recovered by a 30 percent reduction of current interest payments, a reasonably attainable goal.

Records Management, Data Privacy, Security, and Integrity. EUC will contain the same information that COR manually enters on forms. EUC software will contain contract schedule of payments data. Only COR may change data. The COR is authorized access only to currently assigned cases.

All contract data and reports are administratively confidential, proprietary, and not to be released except as approved by the appropriate authority. The field worker remains responsible for integrity, accuracy and security of data.

Existing forms will be used in the pilot. Field data entry will be made on the screen set up to look like forms. The records management office has concurred in this plan.

All data are subject to audit. Records are to be retained according to the agency records schedule. If the network is installed, data received in the regional office will be protected by the system supervisor.

If pilot is successful and network is implemented, a regional office microcomputer could contain data similar to that now key entered and processed outside the office. The COR could enter data at site visits, print and mail hard copy to the regional office contract files for record and audit purposes. Backup disks could be made in the regional office via telecommunication. The regional office would run summary data daily, printing graphic reports for anomalies, progress, etc. Such management tools are not now available. Management reports would be retained as administrative files, not contract files.

Organizational Implications. Currently, COR's mail forms to the region's magnetic tape data key entry contractor weekly ($5000/year). But some end-of-month data is telephoned to the Regional office for completion of forms then hand carried to the data key entry contractor. Under the pilot study, the user will mail EUC printouts to the data key entry contractor for magnetic tape key entry of data. Data is run monthly on the XYZ agency's computer on a reimbursable basis ($30,000/year). Checks are then printed by the Treasury Department (cost unknown) based upon the magnetic tape prepared by the XYZ Agency. Central office prepares management reports based upon other tapes prepared by XYZ Agency. Each of the five regions has a similar system.

A successful regional data network would replace the entire regional system. It could be used by all regions. COR's could transmit data to a microcomputer in the regional office which could produce reports and authorize payments by electronic transfer of funds to contractors.

Environmental Factors. COR's constraints are a power outlet and a telephone at each site. A network would require desk space in the regional office.

Solution Statement

Alternatives. Improvements in ADP support from the existing system have been estimated to require at least two years and cost about $200,000. Non-ADP resources are too slow. No excess ADP equipment is available. The requirement is for a portable and personal automated system.

Software and Hardware Requirements. Our agency microcomputer expert states that commercially available software, which will run on many hardware products, is available to solve the problem with English language user menus. Also, some portable micros come with their own software at one price. Software applications needed will be: a filing or data base, an electronic spread sheet, printing, and possibly telephonic data communication. Each of these applications will need to transfer information between them, so an integrated package is needed. Easily portable hardware to run the specified software, ten-key numeric keypad, legible page-size screen, and portable printer are needed.

Configuration Selection. Some satisfactory products are available for the pilot from GSA Schedules A and C. The combined cost of leasing (at $300 per month) plus the significant residual value of the equipment (at least two thirds original price) exceeds the purchase price in all cases. The purchase prices are:

Brand A Model 1 plus ABC Software - $5000.
Brand B Model 1 includes software - $6000.
Brand C includes software - $7000.

We have the in-house technical ability to get the pilot under way and solve most problems, so we do not need the services of OTP (GSA store). If the pilot is satisfactory, we will request a network of ten field microcomputers plus a regional office computer and printer. From what we learn on the pilot, our requirements may be refined. At that time it may be cheaper to buy all equipment of another brand than the pilot, or to buy additional equipment compatible with the pilot. We will work with the contracting officer to find the lowest cost alternative.

Post Installation Evaluation. The manager and the pilot user will discuss the pilot monthly. After six months the pilot will be evaluated in writing. The elimination of paperwork backlog and absence of late payments are the main criteria. If the pilot succeeds, a proposal for all field workers and the regional office to have EUC and communications will be submitted to higher management.

If the pilot does not indicate a bigger EUC system, the single field worker may continue to use the pilot if he so desires. If not, it will be excessed.

Chapter IX. Appendix C
The Impact of Standardization

The technology of microcomputers is rapidly developing, and the marketplace is volatile. Managers are faced with a myriad of brands and models from which to select. New products continue to be announced while products and companies disappear. How can managers guard against acquiring too many different and incompatible products? What are the technological and management issues? This appendix attempts to provide answers for the line manager.

Managers must recognize that stardardization and compatibility are even more important for software than for hardware. Software often may be used on different manufacturers' hardware. In addition, information and its uses are generally transportable along with software.

Advantages of Standardization

Before acquiring EUC, managers should consider the following benefits of standardization:

Personnel resources:
- Uniform training means more economical use of training resources. It simplifies scheduling through repeated and continual training sessions.
- Mutual support groups reduce the time to search out advice. Innovations are shared by users.
- Since skills are transferable, the absence of an employee does not cripple work production.

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Maintenance:
- Redundancy minimizes downtime.
- For some types of repair, EUC may be economically and quickly maintained by an in-house staff.
- Inventory, storage space, and maintenance equipment are reduced.
- Costs and the number of maintenance contracts are reduced.

Peripherals:
- Sharing of resources is facilitated; fewer devices and parts may be needed.
- Staff gains experience in maintenance of peripherals and their effectiveness in meeting requirements.

Software:
- Data and programs are portable between users. Nevertheless, managers must comply with licensing agreements.
- Modifications of software can be shared.
- Programmers and users will become familiar with software more quickly.
- A large number of users may justify the development costs of custom software.
- An in-house software library may be economical.
- A more comprehensive data base is potentially available for system upgrades, such as networks.
- Unforeseen information sharing will occur to the advantage of the organization.

Procurement:
- Agencies can obtain greater discounts when buying in larger quantities.
- Vendors are more likely to provide expert advice and service to volume customers.

Networks:
- When the decision is made, networks can be completed with less cost and delays. Less hardware and software are required for interfacing.
- Managers may want to set a network standard as a requirement for all EUC, whether or not each user plans to be part of a network.

Disadvantages of Standardization

Possible disadvantages must also be considered:
- Tightly specified standards can significantly reduce the range of competition; carefully considered justifications must be established beforehand.
- Heavy investment in standardization may inhibit development of a comprehensive obsolescence policy.
- Restrictions hamper ability to react to major market or technological changes.
- Some flexibility is lost, particularly to meet unique or special needs.
- Effective standardization may require stringent management controls.
- A waiver process will be necessary.
- Broadly stated standards can sacrifice benefits of having standards.
- An organization-wide definition of needs and a uniform specification for procurements may delay the implementation of microcomputers. It may include too many compromises to truly satisfy many users.

Operating Systems

One step for achieving compatibility is through selection of a standard operating system. This software package allows various pieces of hardware and applications software to operate together. Typically, the operating system is invisible to the end user. A program can operate on different vendors' machines only if they employ the same operating system as a first step. Thus, a common operating system allows for the potential interchange of programs among machines. Programs designed for a common operating system can usually be made compatible with an assortment of brands and models of hardware. Use of a common operating system can enable compatability among data, storage media, and some peripheral equipment. There are exceptions to these instances of compatibility, so managers should obtain written guarantees or demonstrations before buying so-called compatible products.

Some operating systems are said to be de facto industry standards by virtue of their early and widespread use by manufacturers. Agency managers should evaluate an operating system on the basis of "an office standard" in the procurement of hardware and software.

Software Costs

By the end of this decade, software may account for more than half of the cost of a typical microcomputer system.

Hardware by its very nature; i.e., mass produced by automation with increasing capabilities packed into its "chips," is becoming less expensive. Software, which is written by humans and which is very labor intensive, continues to become relatively more expensive. Software tends to be modified ("software maintenance") over time, while hardware will frequently retain the same basic capabilities over its lifetime.

Software problems and requirements for large systems are hard to foresee. With large computers, it is often found that custom software costs exceed all estimates and that results are disappointing. Managers may alleviate or eliminate this software problem with EUC for two main reasons. First, the size and simplicity of smaller systems makes defining requirements easier. Second, there is an ever growing supply of commercially available off the shelf software programs. Such programs can meet the software requirements of the vast majority of end users. In addition, software market competition promotes reliability, purchase and development economies, vendor warranties, user friendly programs, and other advantages for the buyer.
The effort invested in selecting the best software product will pay for itself many times over. Managers may easily find a program that meets their general requirements, but have more difficulty in choosing the optimum software for their specific needs. Managers should make their staff aware of the costs of doing their own programming and should encourage them to find suitable, commercially available products. Custom programming should be done in most cases only by professional programmers, and only when the investment will yield justifiable returns relative to existing commercial software.

End users can select the best software to suit their needs in a variety of ways:
- Use commercially available analysis.
- Read software trade literature.
- Look for those with similar problems.
- Seek advice from technical interest groups and user organizations
- Borrow or purchase software for evaluation. Costs are usually low enough to make this desirable.
- Attend classes, symposia, and seminars in which software is discussed.
- Establish an in-house software evaluation group.

Finally, as a manager you need to anticipate the costs of maintaining a library of commercial software. Most notable of these costs is training and retraining, especially for those staff uncomfortable with EUC. Another frequently unanticipated cost is maintaining and updating documentation and copies of the software. Lastly, administering licensing agreements can be an unexpected duty.

Chapter X. Appendix D
The Network Decision

An important consideration in the design of any office automation system is the flow of information from one point to another. The structure that carries the information back and forth between the source point and the data destination is commonly referred to as the network. A network consists of both hardware and software components, such as telecommunications adapter hardware, and commun-

ications software. This may include a modem and a telephone (dial-up) or dedicated line. Network sizes can vary immensely; two or three wire-connected word processors may be considered a network. The network function could be accomplished by mailing compatible disks, up and down loading files to a common "host" computer, or sharing the same microprocessor with other users (multitasking). At the other end of the technological spectrum, a network can also be a nationwide information system of terminals and computers connected through satellite telecommunications.

Since the users of microprocessors are likely to include all levels of employees, from executives to clerical workers, organizations have begun to recognize the importance of exchanging information among systems, zones, and terminals. The resulting configuration is a network where various office products, such as word processors, computers, electronic copiers, optical character recognition equipment, and facsimile devices communicate with each other to provide the user with the requested information.

Direct data sharing among personal computers (PC's) is impractical. This is primarily the result of the major selling point of a PC, its low price. The low price prevents the PC from having the sophisticated type of operating system capable of handling multiple requests for different data from several sources at once. This is perhaps why most PC users today operate in a stand-alone environment. One solution is to add an information management computer as a network controller and let this computer handle the intricate task of channeling the information to the various PC's as they request it.

Local Area Network

The use of a local area network (LAN) provides an organization with the technological basis for an integrated office automation service. Because considerable wiring needs to be run through your building LAN's involve a certain amount of custom design. Therefore, the decision to install an LAN requires considerable planning.

LAN technology is still in its infancy and developments in all areas are being made at a rapid pace. For instance, some recent products use fiber optic cables as the transmission medium. Another LAN technology will operate over an in-house radio frequency transmitter. The price price range for LAN's vary widely, depending on the size, the complexity, and the number of installations which the LAN can support. Prices range from a few thousand dollars to several million.

Network Approval

Network planning should involve all levels of management responsible for the processes that will be supported by the network. Senior agency management should be closely involved in the approval process for any large scale network. An agency's 5-year Information Resources Management (IRM) Plan is an excellent vehicle for approval and coordination. Although network implementation may not occur for several years, policies and procurements can be planned to ensure compatible connections. Thus, planning can avoid substantial interconnect costs in the future.

GSA review and approval are not required for local, non-voice telecommunications requirements, regardless of amount, or for intercity, non-voice requirements costing $50,000 (purchase price or annual lease) or less.

Network Acquisition

Agency documentation for network acquisition should note communication costs, including wire installation, telephone couplers, and monthly media expenses. Choice of a procurement vehicle for a network acquisition will be predicated upon meeting system requirements, the

size of the expenditure, and agency rules. Managers may wish to move incrementally to a network, which necessitates planning for installations and procurements.

Network Management

Agencies should provide some form of control mechanism to advise new users and maintain a trouble-free network. This may be difficult to implement in the near term because of the lack of a comprehensive established standard and the state of flux that exists in both the microcomputer market and its associated networks. There are signs that activity within the industry may be settling down and that both de facto and industry standards will gain relatively wide acceptance. The network manager should stay abreast of these changes through GSA guides, consultants, user groups, technical literature, etc.

There is an abundance of information available regarding network management. If the network is larger than a few stations and the manager is not experienced in this area, the manager should seek expert advice. The guidance in Appendix B regarding standardization is applicable to relatively small networks.

Chapter XI. Appendix E Regulatory Overview

General contracting regulations are contained in the Federal Acquisition Regulation (FAR), which went into effect April 1, 1984. However, the FAR does not include provisions that are unique to procurement and contracting for information resources such as EUC equipment. The regulations governing the acquisition, management and use of all ADP equipment and software are contained in the Federal Information Resources Management Regulation (FIRMR) (41 CFR 201). The FIRMR was effective April 1, 1984. In its initial issuance, the FIRMR consists of the provisions that were previously contained in Parts 101-35, 36, and 37 and portions of Part 101-11 of the Federal Property Mangement Regulations (FPMR) and Subparts 1-4.11, 1-4.12, and 1-4.13 of the Federal Procurement Regulations (FPR). Therefore, agencies should continue to follow the provisions in the above mentioned FPR and FPMR provisions. However, these provisions must be cited as FIRMR provisions. For example FPR § 1-4.1109-6 is now FIRMR § 201-4.1109-6; and FPMR § 101-35.210 is now FIRMR § 201-35.210. This convention is used throughout this guide.

The FIRMR is modified by a number of temporary regulations and is amplified by various informational bulletins and handbooks. Two recent issuances (FIRMR Temporary Regulation (Temp. Reg.) 71 (previously designated FPR Temp. Reg. 71) and FIRMR Temp. Reg. F-500 (previously designated FPMR Temp. Reg. F-500)) are intended to change the orientation in the regulations that was primarily toward large, complex ADP equipment systems. These changes are discussed in this appendix.

The following is a brief overview of the regulatory requirements in the EUC acqui-

sition process. There are no regulations that apply only to end user computing. EUC must be acquired within the framework of existing regulations. This guide, particularly Chapter Three, is written to satisfy the regulatory requirements. It is current as of the date of printing. In the event of inconsistencies, the regulations take precedence over this guide.

Determination and Justification of Need

Requirements Analysis. The need for all ADPE must be supported by a requirements analysis that is commensurate with the size and complexity of the need. The factors that must be considered in the requirements analysis are listed in § 201-35.207(c) of FIRMR Temp. Reg. F-500.

Determination of the Government System or Item Life. The Government system or item life must be determined for each requirement as part of the requirements analysis. However, § 201-35.208(c) of FIRMR Temp. Reg. F-500 makes the determination of a system/item life optional when the purchase price of a system/item is $25,000 or less and when purchase is determined to be the most likely advantageous method of acquisition. The factors that must be considered in determining the system/item life are listed in FIRMR § 201-35.208(a) and are paraphrased below:

- The period of time during which the proposed item will satisfy the user's needs;
- the rate at which technology is expected to advance;
- the probability that maintenance, parts, etc. will continue to be available beyond the period of intended use; and
- the probability that the item will be reused by another part of the user's agency or another agency when it no longer meets the initial user's needs.

Comparative Cost Analysis. Section 201-35.209 of FIRMR Temp. Reg. F-500 requires that a comparative cost analysis of the alternatives that might satisfy the requirement be conducted to determine the lowest overall cost alternative. The alternatives that must be considered are listed in FIRMR § 201-35.209(a). When the anticipated value of the procurement is $50,000 or less, a cost/benefit analysis justifying the proposed equipment or system may be substituted for a comprehensive comparative cost analysis.

Procurement

Delegations of Procurement Authority (DPA). ADP procurements require GSA authority. However, FIRMR § 201-4.1104-1 grants a blanket delegation of procurement authority to Federal agencies for ADP procurements below certain dollar thresholds. These thresholds were increased in FIRMR Temp. Reg. 71. The table at the end of this appendix contains the current blanket thresholds for ADP equipment, commercially available software, maintenance, and commercial ADP services.

Procurement Alternatives. The various procurement alternatives for acquiring EUC equipment are discussed in Chapter Four of this guide and in GSA Bulletins originally designated GSA Bulletin FPR 61 and GSA Bulletin FPMR F-156.

The Award Decision. The Federal Government's basic policy objective with respect to all ADP procurement is to obtain maximum practicable competition in order to meet its minimum needs at the lowest overall cost, price and other factors considered.

FIRMR § 201-4.1102-9 states that "'Maximum practicable competition' means a negotiated procurement action when proposals are solicited from the maximum number of qualified sources, including small business concerns, consistent with the nature of and requirements for the supplies or services to be procured, to

the end that the procurement will be made to the best advantage of the Government, price and other factors considered. This requires a procurement strategy, suitable to the circumstances, in which the statement of the user's requirement is set forth in the least restrictive terms possible without compromising economy or efficiency. It is designed to elicit from responsible firms capable of satisfying the needs, a number of favorable offers commensurate with the value of the procurement. It is calculated to satisfy the user's needs at the lowest overall cost to the Government, price and other factors considered (see §201-4.1102-10). The quantifiable cost of conducting the procurement and other administrative costs directly related to the procurement process are included." [Emphasis added]

Section 201-4.1102-10 of FIRMR Temp. Reg. 71 defines "lowest overall cost" as "the least expenditure of funds over the system/item life, price and other factors considered. Lowest overall costs shall include purchase price, lease or rental prices, or service prices of the contract actions involved, other factors, and other identifiable and quantifiable costs that are directly related to the acquisition and use of the system/item; e.g., personnal, maintenance and operation, site preparation, energy consumption, installation, conversion, system start-up, contractor support, and the present value discount factor (see also FIRMR § 201-35.210). However, the administrative costs of conducting an analysis to determine the lowest overall cost alternative shall be commensurate with the cost or price of the item being acquired and with the benefits expected to be derived from conducting the analysis. (Also see § 201-4.1103-6 regarding ADPE priced at $25,000 or less.)" [Emphasis added.]

Purchase is usually the lowest cost method for acquiring low cost EUC. Considering other methods of acquisition (lease, lease with option to purchase, etc.) is optional when an agency is purchasing equipment with a price of $25,000 or less, and the total purchase price of all of the equipment and software is $300,000 or less. (See FIRMR 201-35.210, FIRMR Temp. Reg. F-500, and 201-4.1103-6 of FIRMR Temp. Reg. 71.)

Management Considerations

Privacy, Data Security, and Physical Security. FIRMR Subparts 201-35.3 and 201-35.17 discuss the protection of sensitive data and sensitive application systems. Subpart 201-35.17 also contains guidance regarding agency requirements under the Privacy Act of 1974. Guidelines applicable to the environmental and physical security of ADP facilities are contained in FIRMR Subpart 201-36.7.

Equipment Inventory. Federal agencies are required to report their ADP equipment systems with a purchase price greater than $50,000 (or lease charges greater than $1,667 per month) to GSA's ADPE Data System (ADPE/DS). (Until recently, this system was known as the ADP Management Information System and required that all ADPE, regardless of cost, be reported.) Subpart 201-36.5 of FIRMR Temp. Reg. F-500 explains the reporting requirements under the ADPE/DS. However, Temp. Reg. F-500 does not relieve agencies from maintaining internal agency equipment inventories in accordance with normal property management regulations, and GSA reserves the right to require special, one-time submissions of information regarding equipment below the $50,000 threshold.

Records Management. The regulations governing records management are contained in FPMR Part 101-11. These include the creation of types of records such as correspondence, reports, forms, and directives; the organization, maintenance, and use of current records; the disposition of Federal records; micrographics; standard and optional forms; and interagency reports management.

Word Processing. The regulations governing word processing that were previously contained in FPMR Subpart 101-11.9 were canceled by FIRMR Temporary Regulation F-500. Virtually all equipment that is

acquired and used for word processing has general purpose computing capability. Therefor, the management and acquisition of such devices, regardless of their intended use, are governed by the ADP regulations.

References

The following are GSA general and technical publications of interest to users and buyers of EUC equipment.

General References

"Managing End User Computing in the Federal Government." This June 1983 report provides an overview of EUC technology, with emphasis on emerging management problems and possible solutions. It outlines GSA's "managed innovation" program and recommends a series of actions for agency considera tion. For a free copy, write or call OIRM (KA), Washington, DC 20405; telephone FTS/(202) 566-0291.

Information Resources Management Newsletter. The Newsletter features news of interest to information managers in the Federal Government. Copies may be ordered from OIRM (KL), Washington, DC 20405; telephone FTS/(202) 535-7429.

Technical References

GSA Bulletin FPMR F-153, Management and Use of Information Processing Resources. This bulletin was issued on June 13, 1983. It discusses recent GSA actions regarding information resources management and EUC and recommends agency policies and procedures for managing information resources.

GSA Bulletin FPMR F-156, Office Technology Plus (GSA's Computer Store). This bulletin was issued on August 19, 1983. It describes GSA's computer store and the various other procurement alternatives for buying small computers and related software, training, and maintenance.

FIRMR Temporary Regulation 71. This temporary regulation became effective on September 1, 1983. It modifies FIRMR Subparts 201-4.11 and 201-4.12 by raising the dollar thresholds for blanket delegations of procurement authority from GSA; by changing the definition of ADPE to reflect equipment classification changes; by adding conditions under which low cost computers can be awarded on the basis of lowest purchase price; and by making clarifying changes regarding the use of ADP schedule contracts. (See Table on P. 25.)

FIRMR Temporary Regulation F-500. The effective date of this temporary regulation is October 1, 1983. It modifies FIRMR Subpart 201-35.2 by allowing requirements analysis to be conducted on an aggregated rather than an individual basis; by making the determination of a system/item life optional under certain conditions for systems/items costing $25,000 or less; by allowing a cost/benefit analysis to be substituted for a more comprehensive comparative cost analysis when the value of the procurement is $50,000 or less; and by waiving the requirement to conduct a lease/purchase analysis for systems/items costing $25,000 or less under certain conditions. It also changes the name of the ADP Management Information System to the ADPE Data System and changes the reporting requirements so that only general purpose ADP equipment systems costing more than $50,000 (purchase price) or $1,667 (monthly rental) need to be reported.

FIRMR Temporary Regulation F-501. This temporary regulation, which is identical to FIRMR Temporary Regulation 72, was effective April 12, 1983. It implements the Federal Communications Commission Memoran- dum, Opinion and Order of April 12, 1983, to enable the Bell Operating Companies and the Long Lines Department of AT&T to provide limited amounts of new customer premises equipment to Government

agencies when necessary to meet certain critical communications requirements.

FIRMR Temporary Regulation F-502. This regulation was effective October 1, 1983. It prescribes information that GSA needs to review Federal agency requirements for data, facsimile, or record telecommunication systems or services. It also abolishes GSA's Communications Management Information System and consolidates all regulations concerning the review and approval of data, facsimile, and record services.

INCREASED DPA THRESHOLDS UNDER FIRMR TEMPORARY REGULATION 71

	Competitive	Sole Source	Schedule
ADPE	$2.5M (purchase price) $1.0M (annual rental)	$.25M (purchase price) $.10M (annual rental)	$.30M (purchase price) (whether leased or purchased)
Software	$1M (total procurement)	$.10M (total procurement)	Maximum order limitation
Maintenance	$1M (annual charges)	$.10M (annual charges)	Maximum order limitation
Commercial ADP Services	$2M (annual charges)	$.20M (annual charges)	$2M (if competitive) $.20M (if sole source)

Chapter XII. Appendix F
Lessons Learned From the GSA End User Computing Pilot Project

In February 1983, GSA initiated a 6-month end user computing (EUC) pilot project. GSA acquired 20 microcomputers for the Central Office and three for each of its 11 regions. A microcomputer, three software packages, a printer, and two disk drives were distributed to those end users who were best able to demonstrate that EUC would increase their productivity. Each applicant's progress was evaluated quarterly.

The purpose of the project was to gain hands-on experience in the use of EUC to

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help GSA develop agency and Government-wide policies and procedures for managing EUC equipment. The following is a synopsis of the lessons GSA has learned in the pilot project.

Inexperienced Users

The end users' lack of familiarization with the available software packages delayed productivity gains longer than expected. The documentation provided with the software was voluminous and too technical for many end users.

Management must recognize that new users will not become experts overnight. They must ensure that users are not "turned off" to the technology. Technical support should be made available to help the end users through the learning period.

Training

Users reported that hands-on training was much more beneficial than lectures or films. At least 4 to 8 hours of general introduction to microcomputers is sufficient. Hands-on training should be provided on each software package. Spread sheet applications require at least 8 hours training for single applications, with an additional 16 hours training in more complex applications such as budget projections using conditionals and other complex functions. Data base management software training should be 24 to 40 hours.

Disk Storage Capacity

Disk storage capacity on floppy disks was inadequate for the heavier users. Dividing work onto multiple disks often degraded the performance of the software. Many users need 10 to 20 megabytes of hard disk storage.

Random Access Memory (RAM)

The emerging integrated application software products (combination text, spreadsheet, graphics, schedules, communications packages) require RAM beyond the capacity of equipment used in the pilot. Also, memory expansion units are particularly useful for manipulating larger data bases.

Maintenance

All microcomputers come with a 90-day warranty on parts and labor. However, terms of the warranties vary from vendor to vendor. Some require the equipment to be brought in, some provide free on-site maintenance, and others charge a fee for on-site maintenance during the warranty period. Maintenance agreements after the warranty period vary similarly.

Our after-warranty repair costs were $1,500 for 6 months. Repairs have ranged from blown fuses to the replacement of a firmware board in a printer. Replacement parts are expensive. The repair of one defective disk drive unit would cost $200.00 more than a complete new unit because of labor costs and pricing policies.

It is possible for users to perform certain minor repairs (e.g., replacing fuses or video monitor adapters). Temporarily substituting pieces from operable units for defective units can also limit down time.

Benefits

The consensus of our end users was that their operations had benefited from the use of EUC even more than expected. In most cases, the improvements were not measurable in terms of staff hours or dollars saved. More often, the EUC was used to meet needs that were not being satisfied due to staffing shortages.

One unexpected benefit was improved management decisions due to the timeliness and availability of data. Spread sheet and data base management users found that modifications to data were made much more quickly than before, and that data is more accurate and more readily retrievable than when manually prepared. These benefits allow users to respond quickly to requests that they were previously hard pressed or unable to respond to. They feel more secure regarding the accuracy of the data, and they are able to accept more responsibility or increased workload without increased staff.

Many participants were able to measure their cost savings. In the Central Office, approximately $100,000 was spent on hardware and software. Cost savings estimates resulting from their use is estimated at $173,000. In the regional offices, it was estimated that $255,000 in annual cost savings will result from a $200,000 expenditure.

From our experiences, we conclude that microcomputers can help provide better, more timely products and more in-depth analysis and can pay for themselves in 6 months to one year.

Chapter XIII. Appendix G
Records Management Considerations

With the advent of ADC, managers must become more aware of their responsibilities for the management of Federal records. Whether information is created or stored on electronic media or not, it may be an official Federal record.

What Is a Federal Record?

Information created and stored on magnetic tape, magnetic disk, optical disk, etc. are Federal records as defined by 44 U.S.C. 3301 if they are:
"...made or received by an agency... or in connection with the transaction of public business..."
and if they contain:"... evidence of the organization, functions, policies, decisions, procedures, operations, or other activities..."
or because of the:"...informational value of data in them."

Responsibility for record information extends through its life-cycle, from creation through use to disposition (Federal Records Act of 1950, as amended). Consider information gathering, entry, file and report formats, reports analysis, storage and retrieval mechanisms, inactive storage time, and ultimate disposition, whether contained on paper or on electronic media.

In addition to the legal requirements regarding Federal records, managers should consider the following practical aspects of recordkeeping as well.

Which Medium Is the Record?

You should decide whether the electronic record or a paper record produced by the ADP system is the official record. If you consider the ADP system to be an efficient way to produce paper records, then they can be treated (used, filed, retrieved, and

disposed of) in the same way that other paper records are. In this case, the loss of the electronic record would be a nuisance and perhaps costly to replace, but the record would still be available. If the electronic record is considered to be the official record, then extra care must be taken to ensure that it is adequately protected against loss and improper alteration and that it is usable at a later date.

Records should not be created unless necessary and, once created, not disposed of without the proper authority. The record is retained according to the agency's records disposition schedule. Working or reference copies may be destroyed or disposed of when convenient. Agency records officers will help managers determine which information is record or working copies, how long the record must be retained, and whether or not the record has been approved for disposition by GSA's National Archives and Records Service.

Problems of Electronic Records

With EUC, managers should be especially alert to:

- Loss of records by accidental erasure.
- Changes made to working copies which are substantial enough to redefine them as new records.
- If the only record is changed, it could amount to the destruction of a Federal record.

These are strong reasons for making backup copies of electronic information prior to changes and to prevent loss.

Carefully weigh the risks of using electronic files as records. The considerations for paper records (use, organization, retrieval, disposal) also apply to electronic records.

Loss of records could cause an agency significant difficulties. It could leave the Government unable to defend itself against claims or to protect citizens' rights.

Permanent records on any medium must meet the specifications of the National Archives and Records Service, GSA. Because floppy disks are a recent medium, their longevity and quality are unknown. Even if the medium is durable, sizes and formats are often unique to particular vendors and vulnerable to obsolescence.

Will machines remain available to read the disks until disposal is permitted, perhaps after several years? Electronic records are difficult to safeguard against accidental or intentional loss and change unless the system automatically produces backup copies.

Authentication is a challenge. Without verification methods, it is difficult to ensure that a document is truly what it appears to be.

An agency may use information from electronic mail and decision support systems to make key decisions. Since the information can have historical and legal value, assure that the system preseves records. Be aware that some systems automatically erase messages once delivered.

Record Retrieval

Be sure to have a method for finding EUC records/documents regardless of medium (hard disk, floppy disk, or tape). This is important even for single user systems. Without a retrieval method, records will be impossible for others to use.

Data Integrity and Security

Be certain that appropriate safeguards are taken to protect against unauthorized alteration or loss of data. Such practices as backup files, passwords, data encryption, physical security, and instructions for their use will help ensure the integrity of data. Consult the agency security officer for specific guidance.

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